

IN THE CLAIMS:

Please substitute the following amended claims 41, 46 and 62 for the pending claims having the same claim numbers.

Please add in new claim numbers 73-75 for consideration.

1. (canceled)
2. (canceled)
3. (canceled)
4. (canceled)
5. (canceled)
6. (canceled)
7. (canceled)
8. (canceled)
9. (canceled)
10. (canceled)
11. (canceled)
12. (canceled)
13. (withdrawn) A purified antibody to a streptococcal choline binding protein which choline binding protein has the following characteristics:
 - a) choline-binding activity; and
 - b) elution from a chromatographic column in the presence of at least about 10% choline;with the proviso that the streptococcal choline binding protein is not PspA or autolysin (LytA).
14. (withdrawn) A monoclonal antibody to the streptococcal choline binding protein of claim 1.

15. (withdrawn) An immortal cell line that produces a monoclonal antibody according to Claim 14.

16. (withdrawn) The antibody of Claim 14 labeled with a detectable label.

17. (withdrawn) The antibody of Claim 16 wherein the label is selected from the group consisting of an enzyme, a chemical which fluoresces, and a radioactive elements.

18. (withdrawn) A pharmaceutical composition comprising an antibody to a choline binding protein of claim 1 and a pharmaceutically acceptable carrier.

19. (canceled)

20. (canceled)

21. (canceled)

22. (canceled)

23. (canceled)

24. (canceled)

25. (canceled)

26. (canceled)

27. (canceled)

28. (withdrawn) A method for detecting the presence of a streptococcal choline binding protein of claim 1, wherein the streptococcal choline binding protein is measured by:

- a) contacting a sample from in which the presence or activity of the streptococcal choline binding protein is suspected with an antibody to the streptococcal choline binding protein under conditions that allow binding of the streptococcal choline binding protein to the binding partner to occur; and
- b) detecting whether binding has occurred between the streptococcal choline binding protein from the sample and the antibody;

wherein the detection of binding indicates that presence or activity of the streptococcal choline binding protein in the sample.

29. (canceled)

30. (canceled)

31. (canceled)

32. (canceled)

33. (withdrawn) A method for treating infection with a bacterium that expresses a streptococcal choline binding protein comprising administering a therapeutically effective dose of a pharmaceutical composition of claim 18 to a subject.

34. (withdrawn) A pharmaceutical composition comprising an inhibitor of streptococcal adhesion to fibronectin selected from the group consisting of a peptide of not more than 15 amino acid residues having the amino acid sequence WQPPRARI (SEQ ID NO:11), an enolase, and an antibody specific for the amino acid sequence WQPPRARI.

35. (withdrawn) A method for treating infection with a bacterium that expresses a streptococcal choline binding protein comprising administering a therapeutically effective dose of a pharmaceutical composition of claim 34 to a subject.

36. (withdrawn) A method for treating infection with a bacterium that expresses a streptococcal choline binding protein comprising administering a hindered cationic small molecule that inhibits streptococcal adhesion to fibronectin.

37. (withdrawn) The method according to claim 36 wherein the hindered cationic small molecule is selected from the group consisting of lysine, choline, and arginine.

38. (withdrawn) The method according to claim 36 wherein the hindered cationic small molecule inhibits binding of an enolase to fibronectin.

39. (withdrawn) A method for treating infection with a bacterium that expresses a streptococcal choline binding protein comprising administering pulmonarily an adhesion inhibitory agent selected from the group consisting of a choline binding protein having the following characteristics:

- a) choline-binding activity; and
- b) elution from a chromatographic column in the presence of at least about 10% choline;

with the proviso that the streptococcal choline binding protein is not PspA or autolysin (LytA), an antibody to a choline binding protein, an enolase, a hindered cationic small molecule, the peptide WQPPRARI (SEQ ID NO:11), and an antibody specific for an epitope having the amino acid sequence WQPPRARI (SEQ ID NO:11).

40. (withdrawn) The method according to claim 39 wherein the hindered cationic small molecule is selected from the group consisting of lysine, choline, and arginine.

41. (currently amended) An isolated nucleic acid encoding a streptococcal choline binding protein;

wherein the protein is expressed by *Streptococcus pneumoniae* and has the following characteristics:

- a) choline-binding activity;
- b) elution from a chromatographic column in the presence of about 10% choline;
- c) being reactive with sera from patients infected or recovering from infection with the bacteria;
- d) being labeled by fluorescein isothiocyanate (FITC) without requiring streptococcal lysis; and
- e) comprising having an amino acid sequence ~~selected from the group consisting of as set forth in~~ SEQ ID NO:1, ~~and SEQ ID NO:9.~~

42. (previously presented) The isolated nucleic acid of Claim 41 that is a recombinant DNA molecule.

43. (previously presented) The recombinant DNA molecule of Claim 42 that is operatively linked to an expression control sequence.

44. (previously presented) A unicellular host transformed with the recombinant DNA molecule of Claim 43.

45. (previously presented) A DNA vaccine comprising the recombinant DNA molecule of Claim 43.

46. (currently amended) An oligonucleotide capable of screening for a nucleic acid encoding a streptococcal choline binding protein, wherein the oligonucleotide is capable of hybridizing with the nucleic acid encoding an amino acid or its complement encodes at least 5 contiguous amino acids of SEQ ID NO: 1 ~~or SEQ ID NO: 9~~.

47. (canceled)

48. (previously presented) An isolated nucleic acid encoding a streptococcal choline binding protein comprising the amino acid sequence of SEQ ID NO:25 or SEQ ID NO:25 comprising a conservative amino acid substitution; wherein the isolated streptococcal choline binding protein has the following characteristics:

- a) choline-binding activity;
- b) elution from a chromatographic column in the presence of about 10% choline; and
- c) being reactive with sera from patients infected or recovering from infection with the bacteria.

49. (previously presented) The isolated nucleic acid of Claim 48 which comprises the nucleotide sequence of SEQ ID NO:24.

50. (previously presented) The isolated nucleic acid of Claim 48 that is a recombinant DNA molecule.
51. (previously presented) The recombinant DNA molecule of Claim 49 that is operatively linked to an expression control sequence.
52. (previously presented) A unicellular host transformed with the recombinant DNA molecule of Claim 51.
53. (previously presented) A DNA vaccine comprising the recombinant DNA molecule of Claim 51.
54. (previously presented) The isolated nucleic acid of Claim 48 wherein the streptococcal choline binding protein further comprises the amino acid sequence of SEQ ID NO:1.
55. (canceled)
56. (canceled)
57. (canceled)
58. (canceled)
59. (canceled)
60. (canceled)
61. (canceled)
62. (currently amended) A nucleic acid that ~~is substantially homologous~~ has at least 75% identity to the nucleotide sequence of SEQ ID NO: 24, wherein said nucleic acid encodes a protein that is reactive with rabbit antisera generated against an isolated protein consisting of the polypeptide of SEQ ID NO: 25.

63. (withdrawn) A nucleotide sequence that encodes a fragment of a choline binding protein consisting of the amino acid sequence of SEQ ID NO:4.
64. (withdrawn) An isolated nucleotide sequence that encodes a streptococcal choline binding protein comprising the amino acid sequence of SEQ ID NO:19; wherein said streptococcal choline binding protein comprises enolase activity.
65. (withdrawn) The isolated nucleotide sequence of Claim 64 which has a nucleotide sequence as depicted in SEQ ID NO:18 from nucleotide 1 through the stop codon TAA.
66. (withdrawn) A nucleic acid that hybridizes to the nucleotide sequence of SEQ ID:14 and/or SEQ ID NO:18 under highly stringent hybridization conditions.
67. (withdrawn) The isolated nucleic acid of Claim 66 that is a recombinant DNA molecule.
68. (withdrawn) The recombinant DNA molecule of Claim 67 that is operatively linked to an expression control sequence.
69. (withdrawn) A unicellular host transformed with the recombinant DNA molecule of Claim 68.
70. (withdrawn) A DNA vaccine comprising the recombinant DNA molecule of Claim 68.
71. (withdrawn) A method for detecting the presence of a bacterium comprising a nucleic acid encoding a streptococcal choline binding protein comprising:
- (a) contacting a sample in which the presence or activity of the bacterium is suspected with the oligonucleotide of Claim 46; and

(b) detecting whether hybridization has occurred between the oligonucleotide and the nucleic acid; wherein detection of hybridization indicates that presence or activity of the bacterium in the sample.

72. (withdrawn) A method for preventing infection with a bacterium that expresses a streptococcal choline binding protein comprising administering an immunogenically effective dose of the DNA vaccine of Claim 45 to a subject.

73. (new) A nucleic acid that has at least 80% identity to the nucleotide sequence of SEQ ID NO: 24, wherein said nucleic acid encodes a protein that is reactive with rabbit antisera generated against an isolated protein consisting of the polypeptide of SEQ ID NO: 25.

74. (new) A nucleic acid that has at least 90% identity to the nucleotide sequence of SEQ ID NO: 24, wherein said nucleic acid encodes a protein that is reactive with rabbit antisera generated against an isolated protein consisting of the polypeptide of SEQ ID NO: 25.

75. (new) A nucleic acid that has at least 95% identity to the nucleotide sequence of SEQ ID NO: 24, wherein said nucleic acid encodes a protein that is reactive with rabbit antisera generated against an isolated protein consisting of the polypeptide of SEQ ID NO: 25.